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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,203	03/25/2004	Toshimitsu Hirai	9319S-000716	5989
27572 7590 11/23/2007 HARNESSE, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			EXAMINER KIM, SU C	
			ART UNIT 2823	PAPER NUMBER
			MAIL DATE 11/23/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/809,203	<b>Applicant(s)</b> HIRAI, TOSHIMITSU	
	<b>Examiner</b> Su C. Kim	<b>Art Unit</b> 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,5,9 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,9 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE  
PRIMARY EXAMINER

*lee*  
11/19/07

#### Attachment(s)

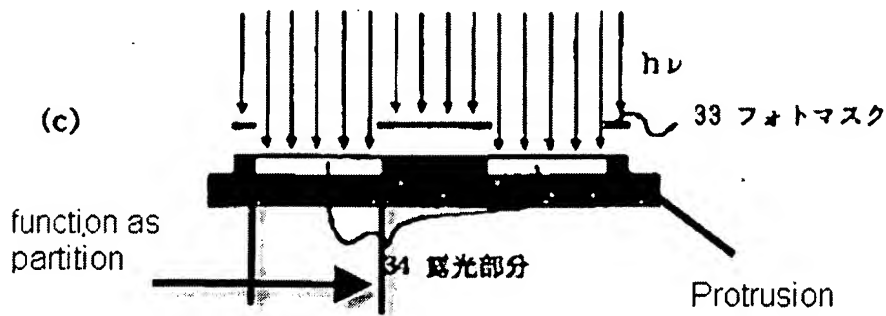
- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**Claim Rejections - 35 USC § 103**

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5, 9, & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamishiro Kazuhiro (JP 2000-243254) ('hereafter Kamishiro') in view of Morii et al. (US 2002/0109456) and further in view of Yudasaka (US 6,476,988).



**Pertaining claim 1**, Kamishiro discloses a method for manufacturing electron emitters by providing pairs of element electrodes, and conductive layers (Drawing 3(h), 2 & 3) connecting the element electrodes (Drawing 3(h), 5) to each other on a substrate (Drawing 2(a), 1), the method comprising:

a step of forming banks (Drawing 2(a)-(c), 34) surrounding electrode-forming regions for forming the element electrodes (Drawing 3(h), 2 & 3) and conductive layer-forming regions 4 for forming the conductive (Drawing. 2 & 3)

a step of discharging first droplets toward the electrode-forming regions (Drawing 2 (a)-2(e));

and a step of discharging second droplets toward the conductive layer-forming regions (Drawing 3-(g)); and

a step of removing bank(Drawing 3(g)-3(i))

a step of lyophilizing at least one of the electrode-forming region and the conductive-layer forming region(Paragraph 0015 & 0021, "while making hydrophilic property of an optical exposure part (bank)" is consider as lyophilizing step)

wherein the bank (Drawing 2(a)-(c), 34) consist of protrusion portions which function as partitions (Drawing 2(c), paragraph 0024, note: the bank is formed with protrusion portions by photolithography technique with etching process which function as partitions).

Kamishiro fails to teach lyophilizing the electrode-forming regions and the conductive-layer forming region using O<sub>2</sub> plasma process, the step of lyophilizing the electrode-forming region and the conductive-layer forming regions removing a residue of the bank formed in the electrode-forming region and the conductive-layer forming region during the step of forming the bank; and the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase;

lyophobic the banks using a CF<sub>4</sub> plasma process, the step of lyophobic the banks introducing fluorine groups into the banks.

However, Morii discloses lyophilizing the electrode-forming regions 12a and the conductive-layer forming region 11 using O<sub>2</sub> plasma process (Fig. 1), the step of

lyophilizing the electrode-forming region 12a and the conductive-layer 11 forming regions removing a residue of the bank 12b formed in the electrode-forming region 12a and the conductive-layer 11 forming region during the step of forming the bank 12 (paragraph 0055);

lyophobic the banks using a CF<sub>4</sub> plasma process, the step of lyophobic the banks introducing fluorine groups into the banks(paragraph 0056 & 0060)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Kamishiro with lyophilizing the electrode-forming regions and the conductive-layer forming region using O<sub>2</sub> plasma process, the step of lyophilizing the electrode-forming region and the conductive-layer forming regions removing a residue of the bank formed in the electrode-forming region and the conductive-layer forming region during the step of forming the bank; lyophobic the banks using a CF<sub>4</sub> plasma process, the step of lyophobic the banks introducing fluorine groups into the banks as taught by Morii in order to provide strong bonding surface.

Kamishiro and Morii in combinations fail to teach the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase.

Yudasaka discloses that the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase (Fig. 10A).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Kamishiro and Morii with the

bank have a tapered shape such that a width of the banks decrease as a height of the banks increase as taught by Yudasaka in order to produce improve reliability.

**Pertaining claim 5**, as applied to claim 1, Kamishiro and Morii in combination disclose all the limitations including, an electron emitter manufactured by the method according to claim 1. (See the rejection on claim 1)

**Regarding claim 9**, Kamishiro discloses a method for manufacturing an electron emitter comprising;

defining a pair of spaced apart electrode (Drawing 3(i), 2 & 3) forming regions on a substrate (Drawing 2 (c)-(d));

defining a conductive layer-forming region on the substrate, the conductive layer 4 forming region interconnecting the electrode-forming regions (Drawing 3 (h));

forming a bank (Drawing 2(c), 32) encircling the electrode-forming regions and the conductive layer forming region (Drawing 2(c)) ;

discharging first droplets (Drawing 2(d), 35) toward the electrode-forming regions to form a pair of element electrodes (Fig. 2 (e)); and

discharging second droplets (Drawing 3(g), 37) toward the conductive layer-forming regions to form a conductive layer connecting the element electrodes to each other (Drawing 3(g)); and

removing the bank after the conductive layer and element electrodes are formed(Drawing 3(f)-(i) and details on paragraph 2 above).

wherein the bank (Drawing 2(a)-(c), 34) consist of protrusion portions which function as partitions (Drawing 2(c), paragraph 0024, note: the bank is formed with

protrusion portions by photolithography technique with etching process which function as partitions).

Kamishiro fails to teach lyophilizing the electrode-forming regions and the conductive-layer forming region using O<sub>2</sub> plasma process, the step of lyophilizing the electrode-forming region and the conductive-layer forming regions removing a residue of the bank formed in the electrode-forming region and the conductive-layer forming region during the step of forming the bank; rendering the bank lyophobic using a CF<sub>4</sub> plasma process, the step of rendering the bank introducing fluorine groups into the bank and the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase;

However, Morri discloses lyophilizing the electrode-forming regions 12a and the conductive-layer forming region 11 using O<sub>2</sub> plasma process (Fig. 1), the step of lyophilizing the electrode-forming region 12a and the conductive-layer 11 forming regions removing a residue of the bank 12b formed in the electrode-forming region 12a and the conductive-layer 11 forming region during the step of forming the bank 12 (paragraph 0055);

render the bank lyophobic the banks using a CF<sub>4</sub> plasma process, the step of lyophobic the banks introducing fluorine groups into the banks(paragraph 0056 & 0060).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Kamishro with lyophilizing the electrode-forming regions and the conductive-layer forming region using O<sub>2</sub> plasma

process, the step of lyophilizing the electrode-forming region and the conductive-layer forming regions removing a residue of the bank formed in the electrode-forming region and the conductive-layer forming region during the step of forming the bank; lyophobic the banks using a CF<sub>4</sub> plasma process, the step of lyophobic the banks introducing fluorine groups into the banks as taught by Morii in order to provide strong bonding surface.

Kamishiro and Morii in combinations fail to teach the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase.

Yudasaka discloses that the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase (Fig. 10A).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant(s) claimed invention was made to provide Kamishiro and Morii with the bank have a tapered shape such that a width of the banks decrease as a height of the banks increase as taught by Yudasaka in order to produce improve reliability.

**Pertaining claim 10**, as applied to claim 9, Kamishiro and Morii in combination disclose all the limitations including, treating a portion of the conductive layer (Kamishiro Drawing 3(g), 4) to form an electron-emitting section (Drawing 3(g), 5).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Su C. Kim whose telephone number is (571) 272-5972. The examiner can normally be reached on Monday - Thursday, 9:00AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Su C Kim  
Examiner  
Art Unit 2823

11/14/2007

HSIEN-MING LEE  
PRIMARY EXAMINER

*[Signature]*  
11/19/07